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British Standards Institution
Report

No. 88—1919.

British Engineering Standards Association.

(Incorporated 1918.)

FORMED IN 1901 AS THE ENGINEERING STANDARDS COMMITTEE
BY
THE INSTITUTION OF CIVIL ENGINEERS.
THE INSTITUTION OF MECHANICAL ENGINEERS.
THE INSTITUTION OF NAVAL ARCHITECTS.
THE IRON AND STEEL INSTITUTE.
THE INSTITUTION OF ELECTRICAL ENGINEERS.

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BRITISH
STANDARD SPECIFICATION
FOR
ELECTRIC CUT-OUTS
FOR
LOW PRESSURE.
TYPE O.

FOR ORDINARY DUTY WITH WORKING CURRENTS NOT EXCEEDING 100 AMPERES.

LONDON:
PUBLISHED FOR THE ASSOCIATION BY CROSBY LOCKWOOD & SON,
7, STATIONERS' HALL COURT, LUDGATE HILL, E.C. 4; AND 5, BROADWAY, LONDON, S.W. 1;
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January, 1919.

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No. 88—1919.

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* Succeeded the late SIR JOHN WOLFE BARRY, K.C.B., February, 1918.

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OF THE
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The Sub-Committee has been assisted in the preparation of this Specification by Dr. C. C. Garrard, representing the British Electrical and Allied Manufacturers' Association, and Mr. W. Cross, representing the Electrical Contractors' Association (Incorporated), and also by Mr. G. J. Baker and Mr. S. W. Baynes.

* President, British National Committee. † Hon. Sec., British National Committee.
‡ Also nominated by the Institution of Electrical Engineers.
** Since deceased.

PREFACE.

The recommendations contained in this Specification are based on published experimental data and other information placed at the disposal of the Committee.

The conclusion has been arrived at that the dimensions necessary to secure efficient operation of a cut-out, for a given working current, depend upon the total resistance of that part of the circuit which is between the cut-out and the generator, added to the resistance of the latter, and not on the resistance of the circuit which the fuse is intended to protect.

The information so far available has only enabled the Committee to prepare standard dimensions within which a satisfactory type of cut-out for ordinary duty, of a type largely in use, can be designed which is suitable for the large majority of cases. The chief object in view in the table of dimensions given on page 10 is to secure interchangeability among the products of different makers of the type of cut-out indicated. This type is a popular one, largely on account of its inexpensive nature, but there are others available for similar duty, possessing certain advantages and it is intended to deal with the standardisation of some or all of these shortly.

The area of the surfaces in contact has not been specified as the pressure between the surfaces is of at least equal importance in securing absence of heating, and it is impracticable to specify this.

Provision for safety in handling the cut-outs when renewing fuses, desirable in all cases and essential in cut-outs used in installations coming under the Factory Acts, has not been dealt with as it is a question of individual design and immaterial from the standardisation standpoint so long as the dimensions specified are adhered to.

The ordinary duty cut-outs are not suitable for use in those cases in which the cut-outs are connected by conductors of very low resistance to large generators. Such circuits require heavy duty cut-outs, for which a Specification will be published by the Committee as soon as the necessary data are available.

This Report was adopted by the Sectional Electrical Committee at their meeting held on 10th July, 1918.

This Report was approved on behalf of the Main Committee on 30th December, 1918.

C. H. WORDINGHAM,

Chairman of Sub-Committee on Electrical Accessories.

Note.—*The Association desires to call attention to the fact that this Specification is intended to include the technical provisions necessary for the supply of the article herein referred to, but does not purport to comprise all the necessary provisions of a Contract.*

BRITISH
STANDARD SPECIFICATION
FOR
ELECTRIC CUT-OUTS
FOR
LOW PRESSURE.
TYPE O.

FOR ORDINARY DUTY WITH WORKING CURRENTS NOT EXCEEDING 100 AMPERES.

I.

DEFINITIONS AND NOMENCLATURE.

Working Current.

1. The Working Current is the maximum current flowing in the circuit intended to be protected when all the devices connected thereto that can be in use simultaneously are working at their full load.

Fusing Current.

2. The normal fusing current is the smallest current which will blow the fuse.

Fuse.

3. The term " Fuse " denotes the actual fusible wire or strip.

Fuse Carrier.

4. The term " Fuse Carrier " denotes the holder or container by which the fuse and its contacts are supported, held or surrounded, and which constitutes a means of handling the fuse.

Fuse Contacts.

5. The term " Fuse Contacts " denotes the contacts attached to the fuse carrier which engage with the circuit contacts.

Fuse Extension.

6. The term " Fuse Extension " used in connection with enclosed type cut-outs denotes any metallic extension within the cut-out connecting the ends of the fuse and the fuse contacts.

Circuit Contacts.

7. The term " Circuit Contacts " denotes the contacts in connection with the circuit terminals and with which the fuse contacts engage.

Cut-Out.

8. The term " Cut-Out " denotes the assemblage of all the above named parts, together with their mounting and base.

Open Type Cut-Out.

9. The term " Open Type Cut-Out " denotes one in which no effectual provision is made to prevent the scattering of molten metal from the fuse.

Placing an open type cut-out in a cabinet or case does not alter its type.

Protected Type Cut-Out.

10. The term " Protected Type Cut-Out " denotes one in which, apart from a containing cabinet or case, provision is made to protect the operator from the molten metal from the fuse.

Enclosed Type Cut-Out.

11. The term " Enclosed Type Cut-Out " denotes one having a fuse which is completely surrounded by a " filling " enclosed in a fire-resisting container.

Special Type Cut-Out.

12. The term "Special Type Cut-Out" denotes one embodying special features of a distinctive character.

Ordinary Duty.

13. The term " Ordinary Duty " is applied to a cut-out or a fuse carrier when the maximum short circuit current in the circuit cannot exceed the value given in the following table :—

Maximum Working Current.	Maximum Short Circuit Current for Ordinary Duty Cut-Out.
Amperes.	Amperes.
10	1,000
30	2,000
60	4,000
100	6,500

SPECIFICATION FOR LOW PRESSURE ELECTRIC CUT-OUTS.

TYPE O.

The four sizes of Fuse Carrier dealt with in this Specification are intended for use with low pressures.*

Standard Sizes of Ordinary Duty Cut-Outs.

14. Four sizes of cut-out shall be standard. They are intended for ordinary duty (see Clause 13) when used with a fuse suitable for carrying a maximum working current and having the corresponding fusing current as shown respectively in the following table :—

Size of Cut-Out.	Size of Largest Fuse.	
	Maximum Working Current.	Corresponding Fusing Current.
	Amperes.	Amperes.
A	10	30
B	30	60
C	60	120
D	100	200

Size of Current Carrying Parts.

15. The dimensions given in this Specification are those necessary to secure interchangeability. Those not given shall be such as to secure that there is no undue heating when carrying the maximum working current continuously.

Material.

16. All parts of the cut-out shall be of fire-resisting non-hygroscopic material. The fuse contacts shall be of non-ferrous metal other than aluminium or aluminium alloys. The circuit contacts shall be of hard spring phosphor bronze or hard spring copper.

---

* The Board of Trade definition of "Low Pressure" is as follows :—"Where the conditions of the supply are such that the pressure at any pair of consumer's terminals does not exceed 250 volts the supply shall be deemed a low pressure supply."

Marking.

17. Each ordinary duty fuse carrier and cut-out base shall be indelibly marked in accordance with the requirements of the following table :—

Size of Cut-Out.	Working Currents.	Marking.
	Amperes.	
A	Up to 10	B.S. 10 amp. O.D.
B	Between 10 and 30	B.S. 30 amp. O.D.
C	Between 30 and 60	B.S. 60 amp. O.D.
D	Between 60 and 100	B.S. 100 amp. O.D.

Dimensions.

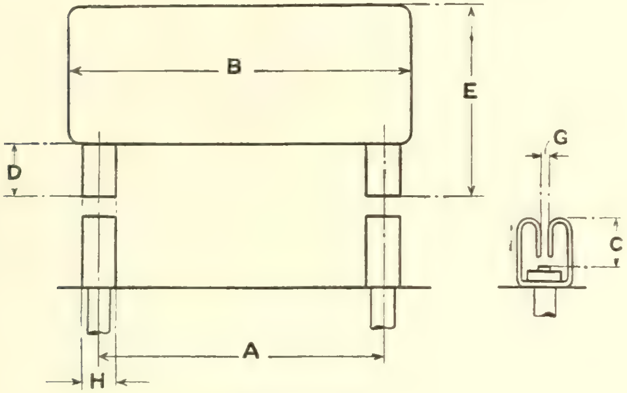
18. The Fuse Carrier, Fuse Contacts, and Circuit Contacts shall have the dimensions shown in the following table :—

Capacity.	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**
Amperes	ins.	ins. Max.	ins.	ins. Min.	ins. Max.	ins. Max.	ins.	ins.	ins. Max.
10	3 ± 1/16	3 3/4	1/2 Min.	1/2	2	*	1/16 to 3/32	3/8 ± 1/16	*
30	3 1/2 ± 1/16	4 3/4	1 to 1 1/4	3/4	3	1/4	7/8	1/2 ± 1/16	2 13/16
60	4 1/2 ± 1/8	6 1/8	1 1/8 to 1 3/8	7/8	3 1/2	3/8	1	3/4 ± 1/8	3 7/16
100	5 1/2 ± 1/8	7 1/2	1 3/8 to 1 5/8	1 1/8	4 1/4	1/2	1 1/4	1 ± 1/8	4 3/16

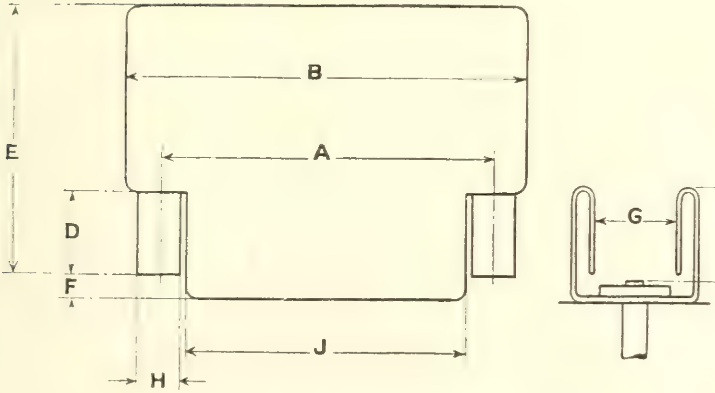
* These dimensions (**F J**) are not required for the 10 ampere Carrier.

NOTE :—Dimension **B** shall cover any projecting screw used to clamp the Fuse.

DIMENSIONS OF ORDINARY DUTY CUT-OUTS (TYPE O.).



10 Ampere size.



30, 60 and 100 Ampere sizes.

APPENDIX I.

Recommendations as to the use of British Standard Cut-Outs.

British Standard Cut-Outs for ordinary duty are suitable for use in all cases in which the maximum short circuit current cannot exceed the value given in Clause 13. They are suitable for use in installations in which the capacity of the plant running at one time does not exceed 100 kilowatts. In such installations no cut-out smaller than Size B (see Clause 14) should be fitted within the dynamo room, and no cut-out smaller than Size C (see Clause 14) should be used on the main dynamo switch board, except for a pilot light or voltmeter, when a Size A cut-out may be used with a fuse for a normal working current not exceeding 3 amperes. In no case is it necessary to use a cut-out of larger capacity than the plant running at any one time.

APPENDIX II.

Recommendations in regard to the Testing of British Standard Cut-Outs.

A cut-out suitable for use on direct current can be relied upon to break an alternating current circuit of somewhat lower resistance. For this reason it is recommended that all tests on cut-outs should be carried out with direct current. When testing an ordinary duty cut-out it is necessary to adjust the resistance of the circuit (of which the generator forms a part) to a value that will limit the current to the values given in the Table in Clause 13, with the fuse short-circuited, and to use a generating plant capable of furnishing this current at the full pressure. No artificial inductance shall be included in the circuit when testing cut-outs.

British Engineering Standards Association.

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JANUARY, 1919.

(This List cancels all previous Lists.)

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